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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/509,957 | 10/04/2004 | Jung-ik Ha | Q83999 | 2993 |
| 23373 | 7590 | 10/05/2005 | | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | EXAMINER MCCLOUD, RENATA D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2837 | |

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/509,957

Applicant(s)

HA ET AL

Examiner

Renata McCloud

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/04/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings are not labeled in English. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because it is not a single paragraph. Also, the reference numbers need to be removed. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1: Lines 1-5 are indefinite. It is unclear what amongst the current, the flux, the torque or the motor, is being controlled independently.

Lines 9-13 are indefinite. It is unclear what is obtained based on a magnetic saliency of a physical quantity of the motor, the error signal or the magnetic flux position.

Lines 23-26 are indefinite. Line 26 recites the limitation "the same observer". There is insufficient antecedent basis for this limitation in the claim.

Lines 27-30 are indefinite. Line 30 recites the limitation "the speed". There is insufficient antecedent basis for this limitation in the claim. It is unclear which speed is being referred to. Also, The term "very" in line 28 is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 2: the limitation "feeding back each of them" in lines 14-15 of the claim is indefinite. It is unclear what "each of them" is.

Lines 16-18 of the claim are indefinite. It is unclear what each deviation is from. Also the phrase "in such a manner" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 10: the limitation "that is" in line 4 of the claim is narrative.

Claim 13: Lines 1-5 are indefinite. It is unclear what amongst the current, the flux, the torque or the motor, is being controlled independently.

Lines 11-15 of the claim are indefinite. It is unclear what is obtained based on a magnetic saliency of a physical quantity of the motor, the error signal or the magnetic flux position.

Claim 14: the limitation "feeding back each of them" in lines 13 of the claim is indefinite. It is unclear what "each of them" is.

Lines 15-16 of the claim are indefinite. It is unclear what each deviation is from. Also the phrase "in such a manner" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 15: The term "very" in line 4 of the claim is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 18: The term "peculiar" in line 6 of the claim is a relative term which renders the claim indefinite. The term "peculiar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "very" in line 6 is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 20: Lines 1-6 are indefinite. It is unclear what amongst the current, the flux, the torque or the motor, is being controlled independently.

Lines 12-16 are indefinite. It is unclear what is obtained based on a magnetic saliency of a physical quantity of the motor, the error signal or the magnetic flux position.

Lines 23-26 are indefinite. Line 26 recites the limitation "the same observer". There is insufficient antecedent basis for this limitation in the claim.

Lines 27-30 are indefinite. Line 30 recites the limitation "the speed". There is insufficient antecedent basis for this limitation in the claim. It is unclear which speed is being referred to. Also, The term "very" in line 28 is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 21: the limitation "feeding back each of them" in lines 12-13 of the claim is indefinite. It is unclear what "each of them" is.

Lines 15-16 of the claim are indefinite. It is unclear what each deviation is from. Also the phrase "in such a manner" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 27: The term "very" in line 3 of the claim is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention

Claim 29: The term "peculiar" in line 6 of the claim is a relative term which renders the claim indefinite. The term "peculiar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Lines 4-5 of the claim are indefinite. The phrase "in such a manner" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 30: Lines 1-6 are indefinite. It is unclear what amongst the current, the flux, the torque or the motor, is being controlled independently.

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Lines 12-16 are indefinite. It is unclear what is obtained based on a magnetic saliency of a physical quantity of the motor, the error signal or the magnetic flux position.

Lines 22-25 of the claim are indefinite. Line 25 recites the limitation "the same observer". There is insufficient antecedent basis for this limitation in the claim.

Claim 21: the limitation "feeding back each of them" in line 9 of the claim is indefinite. It is unclear what "each of them" is.

Lines 17-13 of the claim are indefinite. It is unclear what each deviation is from. Also the phrase "in such a manner" in line 12 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 33: The term "very" in line 4 of the claim is a relative term which renders the claim indefinite. The term "very" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention

Claim 36: The phrase "in such a manner" in line 4 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Allowable Subject Matter

5. Claims 1,13,20, 31 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. Claims 2-12, 14-19, 21-30, 32-36 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or make obvious a sensorless control apparatus of an AC motor which separates a motor current into a magnetic flux component and a torque component based on an estimated magnetic flux position of a synchronous motor without using position and speed sensors and independently controls each of them, thereby implementing a high control performance of the synchronous motor, comprising: a high frequency generator for superposing a high frequency signal on an estimated magnetic flux axis of the motor; a high frequency component extractor for extracting, from a voltage or current detection signal having the same frequency component as a frequency component of the high frequency signal, an error signal of the magnetic flux position which is obtained based on a magnetic saliency of a physical quantity of the motor in a high frequency region generated by a magnetic saturation caused by a main magnetic flux or a conductor skin effect produced by a high frequency; a magnetic flux observer for estimating a magnitude and a position of a magnetic flux from a motor input voltage, a detection current and a speed estimation value; a regulator for adaptively regulating an error signal of a magnetic flux position to be an output of the high frequency component

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extractor; a second adaptive regulator regulating an error signal calculated from a magnetic flux estimation value and an error value of an output of the magnetic flux observer in the same observer; a device for switching the first regulator at a very low speed, the first and second regulators at a low speed and the second regulator at a high speed depending on the speed; and a speed estimator for generating a speed estimation value from an output value of the device.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.-Fri. from 8 am - 5pm.

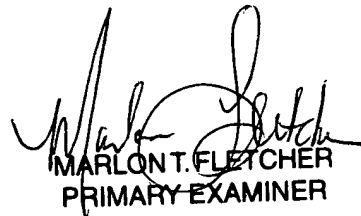
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM



MARLON T. FLETCHER
PRIMARY EXAMINER